

July 11, 2005

Office of Highway Policy Information
Attention: HPPI-20, Room 3306
Federal Highway Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

RE: Delaware HPMS 2004

Dear Sir or Madam:

We are submitting herewith the 2004 HPMS Data in accordance with the reporting requirements.

The 2004 HPMS information reflects the 2000-Census Urban Boundaries. Below is the table of Land Area Population:

Location	Area (Square Miles)	2004 Population
Middletown, DE	3.5	6,546
Dover, DE	58.6	68,088
Georgetown, DE	3.6	8,036
Lewes, DE	17.3	17,297
Long Neck, DE	11.8	9,366
Milford, DE - Kent	5.5	5,409
Milford, DE - Sussex	6.3	8,181
Ocean View, DE	10.4	9,292
Philadelphia, PA--NJ--DE--MD	188.2	474,482
Salisbury, MD--DE	0.6	1,190
Seaford, DE	15.6	22,105
Smyrna, DE - Kent	6.0	14,796
Smyrna, DE - New Castle	1.1	69
Rural	1,625.50	183,563
Total Urban	328.50	644,857
Total Rural	1,625.50	183,563
Total State	1954	828,420

The Land Area was calculated using HPMS Chapter III –2, paragraph 3.

Until the major revisions of the 2000 Census were implemented, the Land Areas reported for previous years since the 1990 Census were calculated using a planimeter, and they included some of the partially covered water areas. For this submission, the Land Area was calculated in accordance with the HPMS guidelines. This year's calculations correctly match the 2000 Census measurements of Delaware's total land area of 1954 square miles. This correction in the procedure accounts for the data discrepancies with previous submissions, including a nearly 10% drop in the land area of the Philadelphia Urbanized Area.

Below is the name and phone number of the person who calculated the land area:

Mamie Lynch
 Edwards and Kelcey
 1247 Ward Avenue, Suite 100
 West Chester, PA 19380
 302-760-2458

Based on the 2000 Census data, the Delaware Population Consortium provided the following population data and forecasts by each county of the State.

County	Area (Square Miles)	Population				
		2000	2000 Census	2003 Census	2004	2005
New Castle	427	501,933	500,265	515,074	520,239	524,815
Kent	589	127,085	126,697	134,390	136,096	138,349
Sussex	938	157,430	156,638	168,027	172,085	175,749
Total State	1954	786,448	783,600	817,491	828,420	838,913

Source: DE Population Consortium, 2004

2003 - 2004 Mileage Table			
Type	2003	2004	Change
Road Inventory	3896.29	3892.43	-3.83
Suburban	1290.15	1317.11	26.96
Municipal	706.81	720.27	13.46
DOD		43.00	43.00
ACE		69.99	69.99
Total	5893.25	6042.80	149.58

Road Inventory Mileage

A decline of 3.83 miles in the road inventory was due to number of reasons; one of the major reasons is the opening of the last section of SR-1 toll road in 2003, which resulted in dead-end roads.

Over 75% of the road inventory data has not been updated in the past 3 years.

Suburban Street Mileage

There are three counties in Delaware: New Castle, Kent & Sussex. In New Castle and Kent counties, suburban streets must be built to meet State regulations for acceptance in the State maintenance program. However, in Sussex County, suburban streets can be built to county standards, which are also accepted for State maintenance. There was an increase of 26.96 miles in Sussex County after the year 2003. Lower interest rates as well as real-estate speculations account for this increase.

In the HPMS universe, suburban street mileage is grouped by county, rural and urban areas, and number of lanes as well as by Direction (1-way, 2-way). All of this mileage is local, and traffic counts are made every five years on limited sections for review.

Municipal Street Mileage

There are 57 municipalities in Delaware. The increasing population, and annexations of the adjoining lands by municipalities are the trends of growth. Municipal Aid Fund is used for cash distribution to municipalities based on street mileage and population. There was an increase of 13.46 miles the municipal street mileage in 2004.

DelDOT maintains and updates the road inventory mileage of all municipalities.

Department of Defense Mileage (DOD)

In 2004, Delaware added 43 miles of local roads, now under the jurisdiction of Department of Defense. This mileage exists inside the Dover Air Force Base, and conforms to the guidelines of public road mileage. At the entrance of Dover Air Force Base, civilian employees and non-employees are required to pass through security clearance, show identity cards, and explain the purpose of their visit. Under the new Home Land Security guidelines, these procedures are very common in state and federal office buildings. It is anticipated that Delaware will need a regional airport to accommodating both the civilian and air force operations in Dover.

Every few years, the US Department of Defense consolidates Air Force Base operations; some bases are closed while others are consolidated. The closest international airports from Dover (Capital of Delaware) are Philadelphia, PA, Baltimore, MD and

Dulles, VA. The travel time to each of these airports is approximately two hours from Dover. Thus, Delaware will need a regional airport in the future. The joint use of civilian and Air Force flight operations may be cost-effective. These 43 miles of local roads inside the Dover Air Force Base were not included in previously submitted HPMS data.

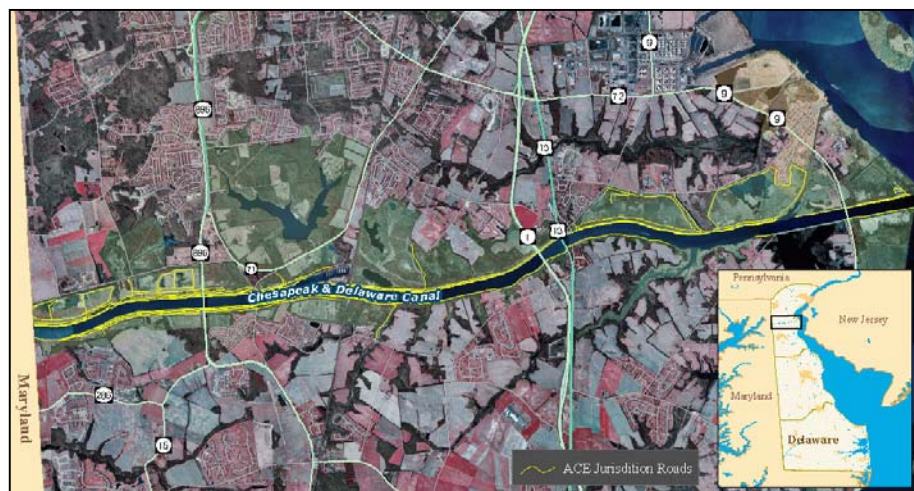
The person who provided the Dover Air force mileage, lanes, and AADT is:

Mr. Edward Rotzinger, Chief, Resources Flight,
United States Air Force
Dover AFB, DE 19902
302-677-6822
Edward.Rotzinger@dover.af.mil

Army Corps Of Engineers Mileage

In 2004, Delaware added 69.99 miles of local dirt roads in the proximity of Chesapeake and Delaware Canal. These roads are presently being used by the public and comply with the guidelines of public road mileage. Delaware Congressman Michael N. Castle, and other state and local officials as well as public, are interested in converting some of the adjacent lands to a state public park.

The State GIS Analyst, Sarah Burkett, in coordination with the Army Corps of Engineers' Chesapeake City Project Office, has used GIS technology to calculate the mileage of roads along the C&D Canal. The methodology included heads-up digitizing of roads using a 2002 high-resolution (1:2,400 scale) infrared orthophotography base with reference to 2005 satellite imagery, and hard copy maps from the Atlas of Delaware produced by DelDOT. Total mileage of the roadways was calculated using GIS length calculation tools, resulting in 66.99 miles. Army Corps of Engineers was given hardcopy maps of the digitized roadway for review. DelDOT and ACE mutually agreed to use this calculation for state mileage reporting purposes.



Map displaying ACE Jurisdiction Roads identified using GIS technology.

Below is name and contact information for the US Army Corp of Engineer engineer who reviewed the GIS data and mileage calculations:

James R. Tomlin, Jr.,
Resident Engineer
Chesapeake City Project Office
U.S. Army Corps Of Engineers
P.O. Box 77
Chesapeake City Maryland 21915
410-885-5621
James.R.Tomlin@nap02.usace.army.mil

Mr. Tomlin provided a letter stating his approval of the calculated mileage.

Our response to the Valid Errors Summary Report is as follows:

- Error Messages 1: Future AADT growth is 4 times or more than AADT
County 1(Kent County) - Section ID: 000160002180

Response: Kent County Rd 16, designated as Delaware Route 8, is an Urban Minor Arterial, with an AADT of 1,455 vpd and the forecast AADT for the year 2025 is 8,573 vpd.. The traffic forecast accounts for additional growth, which may take place in the long-range horizon year due to recently completed ramps between Delaware Route 8 and Delaware Route 1, which are in the vicinity of this sample section.

- Error Messages 2: Unusually high number of intersections (> 25 per mile)
County 1(Kent County) - Section ID: 000290001290

Response: Kent County Road 29, also called East Commerce St. in Camden. This sample sections is an Urban Collector, and has a Section Length of only 0.04 miles. The number of intersections is correct.

- Error Messages 3 & 4: Future AADT growth is 4 times or more than AADT
County 1(Kent County) - Section ID: 000880000360

Response: Kent County Road 88, Leipsic Road, is an Urban Minor Arterial, with an AADT of 1,495 vpd, and the forecast traffic is 9977 vpd for the year 2025. The sample is located next to a recently completed Home Depot building materials store and proposed regional retail center, which will lead to increased traffic volumes.

- Error Messages 5: Future AADT growth is 4 times or more than AADT
County 1(Kent County) - Section ID: 000020007770

Response: New Castle County Rd 2, designated as Delaware Route 9, is a Rural Minor Arterial, with an AADT of 1,483 vpd, and the forecast traffic is 6348 vpd for the year 2025. Delaware Route 9 is also a Scenic Route and passes through historical town of Delaware City. This town has a refinery and a port. Recent zoning changes, and residential developments account for this forecast.

- Error Messages 6: Future AADT growth is 4 times or more than AADT.
County 3 (New Castle) - Section ID: 000340000870

Response: New Castle County Rd 34, designated as U.S. 13, is a four- lane Rural Minor Arterial. The traffic volume on this section is 8,303 vpd, and the traffic forecast for the year 2025 is 53,698 vpd.

There is a conflict of traffic movement resulting from toll avoidance on a ramp within this HPMS section. The reported traffic volume for this segment appears to reflect toll diversion, which actually occurs at a different point based on traffic counts and observation. The traffic forecast reflects traffic levels assumed at a point on a roadway segment before that in which the toll diversion takes place.

- Error Messages 7: Unusually high number of intersections (> 25 per mile)
County 3 (New Castle County) - Section ID: 000390000220

Response: New Castle County Road 39, also called North Broad St, Middletown. This sample sections is an Urban Collector, and has a Section Length of only 0.12 miles. The number of intersections is correct. In this Small Urban Area in the Standard Sample Volume Group that is the only sample available.

- Error Messages 8: Unusually high number of intersections (> 25 per mile)
County 3 (New Castle County) - Section ID: 000500000520

Response: This is an urban sample section in the Wilmington CBD area, and the number of intersections is correct.

- Error Messages 9: At peak capacity for more than 13 hours
VSF must be less than or equal to 1.20
County 3 (New Castle) - Section ID: 000590001820

Response: New Castle Rd.59 is Interstate I-95. The AADT for the year 2004 on this section of the road was 140,533 vpd. It is a very small sample section with a length of 0.31 miles with a V/SF ratio of 1.43. This portion of I-95 northbound splits into I-95 and I-495. The traffic volume is indeed extremely high on this stretch of Interstate 95.

I-95 is currently under a planning study for major improvements. The proposal is widening of I-95 in the marsh area for 5 lanes in each direction. We also plan to

redesign both on and off ramps at I-95 and SR-1 interchange. The work on this project should begin in 2006, and be completed in two years. (Source: Darren O'Neill, Project manager.)

- Error Messages 10: Unusually high number of intersections (> 25 per mile)
County 3 (New Castle County) - Section ID: 002530000570

Response: News Castle County Road 253 is also called Benge Road. This sample section is an Urban Collector, which has an AADT of 630 vpd with a Section Length of 0.01 miles. The number of intersections is correct. This may be one of the software-generated errors. Please review our comments about the software problems.

- Error Messages 11: VSF must be less than or equal to 1.20
County 3 (New Castle) - Section ID: 002940002380

Response: New Castle Rd 294, Valley Road, is an Urban Minor Arterial where the 2004 AADT was 10,161 vpd. It is a two-lane road with high K-Factor of 14% and Directional split of 55%. There is traffic congestion, but the AADT is correctly reported.

The one-day turning movement counts on Valley Road shows a peak hour factor of only 10.6% and directional split of nearly 62%.

At present there are no projects that would significantly improve capacity there in the near future.

- Error Messages 12: Unusually high number of intersections (> 25 per mile)
County 3 (New Castle County) - Section ID: 003360005730

Response: This is an urban sample section in the Wilmington CBD area, and the number of intersections is correct.

- Error Messages 13: VSF must be less than or equal to 1.20
County 3 (New Castle) - Section ID: 003550000730

Response: New Castle County Rd. 355, also called, Harmony Road is designated as Urban Minor Arterial. The AADT for the year 2004 on this section of the road was 20,713 vpd. This sample section has a length of 0.73 miles and V/SF ratio of 1.37. The AADT for the same section for 2003 was 19,596 vpd, which increased by 5.70% in one year. This is a recurring condition, and is expected to continue until 2007.

According to Mark Tudor, Project Manager for the SR4/Harmony Road intersection improvements project, the construction, scheduled for completion in 2007, would increase the capacity of this intersection.

- Error Messages 14: Unusually high number of intersections (> 25 per mile)
County 5 (Sussex County) - Section ID: 000180020740

Response: Sussex County Road 18, U.S. 9, is in Georgetown Small Urban Area. This sample section is an Urban- Other Principal Arterial, and has a Section Length of only 0.04 miles. The number of intersections is correct. It is one of those samples, which being small, creates an automatic software generated error.

- Error Messages 15& 16: Unusually high number of intersections (> 25 per mile)
County 5 (Sussex County) - Section ID: 000500004000
County 5 (Sussex County) - Section ID: 000500004520

Response: Sussex County Road 50 is designated as Delaware Route 1, and these samples are in the town of Bethany Beach; the number of intersections is correct.

- Error Messages 17 & 18: Unusually high number of intersections (> 25 per mile)

County 5 (Sussex) - Section ID 005360004580

County 5 (Sussex) - Section ID 005360004630

Response: These two sample sections are Urban Minor Arterials in the city of Seaford; the number of intersections is correct. This is a recurring condition.

- Error Messages 19: VSF must be less than or equal to 1.20
County 5 (Sussex County) - Section ID: 005390000480

Response: Sussex County Road 539, Sussex Ave, is a roadway in the municipality of Seaford, and is functionally classified as Urban Minor Arterial. Traffic generated in this area is due to the old Dupont plant, a golf course and a middle school. This section has only two lanes and has speed limit of 25 mph. These are reoccurring conditions and the AADT is correctly reported

The contact person in charge of forecasting traffic in DelDOT is:

Michael DuRoss

Transportation Planning Supervisor

302-760-2110

Michael.Duross@state.de.us

Response to HPMS Data in 2003

Last year, DelDOT submitted HPMS data conforming to the reporting requirements. We were asked to improve the quality of traffic and site specific data to meet rigid guidelines of the TMG, and we are seriously working toward achieving the objective.

2004 Sample Status

We are reporting 733 Standard Samples for 2004. In 2003 we reported 643 samples. The 90 new samples were added to meet the requirements of 2000 census updates.

Donut Sample Volume Group

In 2004 we have added 37 new samples to meet the guidelines requirement for all volume groups. The following table shows the progression of Donut Samples.

Year	Donut Samples	Samples Added
2000	89	
2001	109	20
2002	118	9
2003	175	57
2004	212	37

The AADT, reported in Delaware, is for the entire universe of the state including roads and streets classified under the local category. The actual counts are made for all state- maintained roads. For Suburban Street mileage and municipally - maintained roads, which are grouped, we use sampling procedure as well as engineering judgment. The function of Donut Samples is to estimate DVMT in Rural and Small Urban Area, for Urban and Rural Minor Arterial, Urban Collector and Rural Major Collector. For the State of Delaware, we provide the entire universe data on the summary sheet A (Daily Travel Information in Thousands).

Percent Trucks: We have contracted Edwards and Kelcey, consultants; to manage classification data collections on 1/3 of the Standard Samples as required under HPMS guidelines.

HPMS Roughness Reporting Requirement

We followed the guidelines mentioned on Table IV-3 in the HPMS Manual. When the choice is “Required and Recommended,” it is very easy to define by functional classification, the roads for which IRI is required. For recommended standard samples, instead of only on section length, the IRI was collected on the entire road.

A copy of the response from the consultant in charge of collecting the IRI data is as follows.

The following description of our IRI collection method should meet your needs:

Roadware collects roughness (IRI) on DelDOT's HPMS roads using a state-of-the-art data collection vehicle known as an ARAN. The ARAN, equipped with a dual wheel path inertial profiling subsystem (Laser SDP), consisting of specialized electronics, precision accelerometers and displacement transducers (lasers) mounted in each wheel path, records the longitudinal profile of the roadway to calculate the IRI. The Laser SDP (Laser South Dakota Profiler) subsystem is capable of measuring longitudinal profile and roughness in both wheel paths accurately at constant speeds as low as 16 mph, which reduces dropouts and ensures reliable data collection in traffic. The Laser SDP software collects and stores profile measurement data at selected longitudinal distance intervals. Data samples for roughness are collected at half inch intervals at speeds between 16 and 70 mph. Profile is calculated for wavelengths from 0.5 feet to 1,000 feet.

The ARAN software calculates an IRI (International Roughness Index) in compliance with the World Bank Technical Paper # 46 in real-time. The Laser SDP meets the definition of a Class 1 profiler, provided in the ASTM E 950 Standard Test Method, and that of a Class II profiler provided in the FHWA's HPMS (Highway Performance Monitoring System) Field Manual.

The IRI is reported as a section average of both left and right wheelpaths. The IRI is calculated using the quarter-car approach. The most traveled lane is collected; on most roads this is the right-hand lane. Direction of travel during data collection is chosen to match the direction of increasing chainage in DelDOT's road database system.

Sincerely,

Michael Nieminen, P.E.
Project Manager
Project and Account Mngnt Office
Phone: 1-519-442-2261 x260
Cell: 1-519-757-9961
mnieminen@roadware.com

Changes Planned for 2005 HPMS Data

The Delaware Department of Transportation has engaged consultants for IRI and traffic counts and to compile the HPMS data. The IRI data were collected in 2004; we have no plans to collect it in 2005, because the information is required in 2-year cycles

We now have 22.78 miles of Rural and Urban Principal Arterial highways with AADT below 10,000, and 9.45 miles of Rural and Urban Local highways, which are operating, with an AADT of above 10,000 vpd.

We wish to review the entire functional classification of the statewide highway network and make recommendations for change.

Delaware is a coastal state where the summer population on beach resorts can increase substantially. The seasonal counts made for one week and multiplied by the factors to come up with AADT may lack adequate reliability.

We plan to reevaluate the seasonal group factors and directional splits, especially on summer routes.

LRS FOR GIS PRODUCTS

We have coded the LRS data for the 2004 HPMS submission. The road centerline file was forwarded to Tom Roff in ESRI shapefile format with associated metadata on July 11, 2005. The attribute data for the centerline includes the LRS identification field and DelDOT's linear referencing fields including roadway ID, beginning mile point, and ending mile point.

The contact information for the DelDOT employee in charge of LRS is shown below:

Sarah Burkett
Senior GIS Analyst
DelDOT
800 Bay Road, P.O. Box 778
Dover, DE 19903
302-760-2527
Sarah.Burkett@state.de.us

SITE- SPECIFIC TRAVEL ACTIVITY/VEHICLE CLASSIFICATION DATA:

Site-Specific Data: We have counted one-third (1/3) of HPMS samples classification locations in 2004. An additional 1/3 will be counted in 2005 and reported in next year's submission.

There were issues with the TRADAS software, which required manual calculation for trucks this year. We anticipate submitting this information, in TMG format, by August 15th. The short-term counts were used on the roads counted and metrics were used for the remaining samples. Edwards and Kelcey will provide the data in TMG format for the portable counts while Fred Hengst, DelDOT will provide the data for the permanent locations.

At this time, the Automatic Vehicle Classification (AVC) and Weigh-in-Motion (WIM) programs are operational. There are 23 sites, where classification equipment and weigh - in - motion sensors are installed. The calibration was conducted on these sites in 2004.

K & D Factors: During the year 2004, the K & D factors were obtained by actual counts at 120 locations. The remaining samples used traffic group data.

We plan to count the entire interstate and ramp sections in 2005 to provide a more accurate baseline for future trends.

The contact information for the DelDOT employees in charge of these AVC and WIM sites are:

Fred Hengst, TIS, Application Support Project Leader
302-760-2622
Fred.Hengst@state.de.us

Jim Ho, Senior Highway Planner
302-760-2163
James.Ho@state.de.us

New Samples for 2004: In 2003, DelDOT reported 643 samples. Now for 2004, we are reporting a total 733 samples.

Using the HPMS Software to calculate the Standard Sample Adequacy, We made the following changes:

1. Added 90 samples to meet the volume group requirements for the 2000-Census.
2. Deleted only 1 sample due to the non-existence of that section.

To observe travel trends for future Delaware needs, we plan to add samples to Interstate/Freeways & Expressways exceeding the minimum sample requirement.

Delaware now has more samples than the HPMS sample guideline requirement. Besides HPMS needs, we also include samples where major growth and traffic patterns are likely to change.

The Delaware 2000-Census Boundaries updates were officially released on May 23, 2005. We had very little time and resources to conduct field reviews.

Small Universe Section: Delaware HPMS universe has several small sections. Delaware also uses HPMS database to establish the mileage and vehicle-miles of travel for the municipalities. As of 2004, there were 57 municipalities. For funds allocation to the municipalities, the existing formula used by Delaware Legislature is based on municipal population and street mileage. This is an ongoing process.

Travel and Demographic Data: The 2004 Population data were derived from the U.S. Census. The Delaware Land Area is 1954 square miles that conforms to the 2000 U.S. Census.

Population: The yearly change in population is tabulated below:

County	Population by Year		
	2003	2004	% Change
New Castle	515,074	520,239	1.00%
Kent	134,390	136,096	1.27%
Sussex	168,027	172,085	2.42%
Total State	817,491	828,420	1.34%

There is lot of population migration from other states to Sussex County. The cost of living, price of affordable housing, open space and environmental benefits are some of the major reasons. Looking at the Census Demographic changes, many of these new comers are retirees.

Review of the changes in Ethnic characteristic, Sussex County's Hispanic population grew 369 percent between 1990 and 2000.

Daily Vehicle Miles of Travel: The table below shows DVMT comparison by county:

Daily Vehicle Miles Travel (000)			
	Year		Annual Change
	2003	2004	
New Castle County	15,057	15,092	0.23%
Kent County	4,016	4,445	10.68%
Sussex County	5,613	5,842	4.08%
State of Delaware	24,686	25,379	2.81%

The entire, SR-1 Toll route was opened in 2003. Dover the capital of Delaware now has a freeway connecting and Interstate I-95.

According to the 2000 Census, there are six small urban areas in Sussex County: Georgetown, Lewes, Long Neck, Milford, Ocean View, and Seaford. Sussex County also includes a part of Salisbury Urbanized Area.

Looking at the Forecast Transportation and Land Use Network, it appears that there is a significant increase in the permanent population of Rehoboth Beach and its vicinity.

Office of Statewide & Regional Planning herein DelDOT provided the following information:

“The significant increase in traffic in Sussex County has occurred primarily in the SR-1 corridor and is most likely attributable to the increased volume of residential building permits. The number of permits issued annually has doubled over the last seven years. Much of the residential growth has occurred just west of SR-1 and off Route 24 in the Long Neck area.

There has also been an increase in commercial space along SR-1 (new shopping areas and motels) and in the redevelopment of existing commercial lots to better usage, e.g. Rehoboth Mall developing to Wal-Mart, both of which are attracting more traffic to the SR-1 corridor and surrounding communities.

We are presently reviewing this unusual growth in seasonal traffic and long-term land use in the area. For this purpose, the relevant planning agencies, local governments as well as the Department of Transportation, are engaged in an ongoing review of the land use and transportation studies in progress.

There are three studies currently underway by Division of Transportation Solutions looking at regional traffic issues in eastern Sussex: Rehoboth Entrance Study, Western Bypass Study, and US 113 Study.”

National Highway System (NHS): In 2004, the entire SR-1 was opened to traffic. The NHS mileage is 321.72 at this time. In 2003 we reported 320.63, this 1.09 miles increase is due to an additional section of roadway being designated as the Strahnet Connector, while part of the prior Strahnet connector was downgraded, but remains on the NHS as a regular NHS route.

Strategic Highway Network (STRAHNET): The STRAHNET mileage as reported in the 2003 HPMS is 147.64, including 40.61 miles of the Interstate Highway System. In 2004 we are reporting 146.90 and this decline of .74 miles is due to the STRAHNET CONNECTOR being changed from a starting point at the Dover Air Force Base Main Gate to a starting point at the North Gate.

Intermodal Connector: Delaware has 3.23 miles of Intermodal connector mileage.

It seems the table showing roadway mileage for Delaware on web site of FHWA is incorrect, review maybe necessary

(<http://www.fhwa.dot.gov/hep10/nhs/nhs2001mileage.html>)

Toll Routes

In 2003, DeIDOT reported 53.33 miles of toll roads, while in 2004, we are reporting 48.40 miles with a reduction of 4.93 miles. Even though the entire SR- 1 route from I-95 to Dover is designated as a toll road, a part of it is under the jurisdiction of the US Army Corps of Engineers. There is no toll on the bridge above the C& D canal and its approaches. We have updated the information correctly in 2004.

Traffic Volatility: The HPMS universe is derived from our Highway Inventory Records. Due to recreational traffic in the summer as well as the peak traffic in urbanized areas (Dover and Wilmington), there is a tendency by local residents, (familiar with area roads) to use short-cuts bypassing the congested mainline traffic. As a result, unusual traffic conditions exist in many roadway sections of lower functional classification.

Lane Width: The lane width is based on road markings. Much of Delaware Road Inventory data are over three years old. As we continue to update our Inventory files, the necessary changes will take place.

Road Inventory: In the past two years, Interstate, Freeways and Expressways and most of Other Principal Arterial Highways and Streets have been inventoried. We are developing a plan to complete the inventory of other roads in the network. We have recently acquired electronic inventory data collection software, and are in the beginning stages of implementing. Once a good assessment of the rate of data collection with the new method can be determined, we can estimate a time frame to implement the plan.

The name, telephone number and e-mail address of the DelDOT contact person in charge of Road Inventory are shown below:

Kevin Gustafson
Road Inventory Supervisor
302-760-2142
Kevin.Gustafson@state.de.us

Measured Pavement Roughness (IRI): IRI data were collected in 2004, and the next IRI data will be collected in 2006. The data is collected and reported, statewide, on the two-year cycle.

Present Serviceability Rating (PSR): The Pavement Management Section collects the PSR data annually. The 2004 data are submitted herewith.

Pavement Data Statewide Summary: In 2004, we are reporting 69 miles of unpaved roads. This mileage is under the Jurisdiction of U.S. Army Corps Of Engineers.

Highway Surveillance Systems: All of the information provided to us for the 2004 HPMS submittal came from the new Transportation Management Center (TMC) and DelTrac Geospatial Data Layers dated March 24, 2005. In 2005, a thorough review was completed for Permanent Variable Message Signs, Highway Advisory Radio, Surveillance Cameras, Free Cell Phone (#77) with 911, which cover the entire State of Delaware and On-call Service Patrol.

Future improvements for 2005:

- Additional Monitoring Cameras
- Variable Speed Limit System on I-95
- Additional Variable Message Signs
- Additional Traffic Speed/ Volume Detectors (Radar), and
- Wireless and Fiber Optics Communications Enhancements.

Below is the contact information for the DelDOT employee in charge of the Highway Surveillance System information is furnished below:

Darin Dell, CADD/GIS Manager
Tel. (302) 760-2632
Fax (302) 760-2789
Email: Darin.Dell@state.de.us

Delaware Interstate Travel

The following Interstate routes exist in Delaware.

Interstate Route	Total Miles	Urban Areas Served
95	23.43	Pennsylvania
295	5.71	Pennsylvania
495	11.47	Pennsylvania
Total	40.61	Pennsylvania

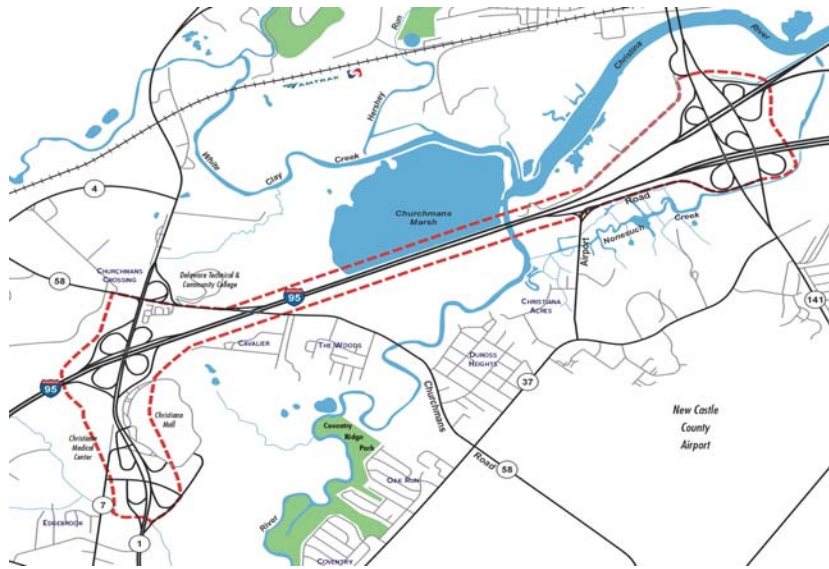
Since 1995 the traffic on the Interstate has continued to change, while the number of through lanes and miles remains the same. The Table below shows the Daily Vehicle Miles of travel since 1995.

Year	DVMT (000)	Change
1995	3,384	N/A
1996	3,478	2.78%
1997	3,805	9.40%
1998	3,698	-2.82%
1999	3,842	3.90%
2000	3,807	-0.92%
2001	3,789	-0.46%
2002	3,766	-0.61%
2003	3,808	1.12%
2004	3,852	1.15%

The Daily Vehicle Miles of Travel from 2000 to 2004 shows stagnation on the interstate system. The HPMS 2004 sample records show that the Interstate 95 section, from Del Route 273 to Del Route 141 interchange, amounting to 5 miles of the interstate is operating at undesired level of service. Volume/Service Flow (V/SF) ratio exceeds 0.80.

SR 1 Interchange/ I-95 Mainline Study Area

I-95 is currently under major improvement study. Potential improvements for this segment currently being analyzed, but no improvements anticipated within 3 years for this segment. (Source: Darren O'Neill, Project manager.)



The following table indicates the mileage by county, where the V/SF ratio continues to exceed 0.80 since 2000.

Miles by County With Volume/Service Flow Ratio (V/SF) exceeds 0.80
(V/SF multiplied by Sample Expansion factor)

Year	County			Total
	New Castle	Kent	Sussex	
2000	35.62	12.20	9.37	56.23
2001	41.89	17.46	36.94	96.29
2002	71.68	16.38	22.70	110.77
2003	80.93	15.26	19.12	113.80
2004	66.38	12.95	30.99	110.32

In 2004, there was an improvement of V/SF above 0.80 on 11.14 miles of road in the network. This is attributed to the completion of SR -1. The V/SF ratio has decreased on U.S. 13 in Kent and New Castle counties. SR-1, which runs parallel to U.S 13, now serves as the main North-South route from Dover in Kent County to Interstate I-95 in New Castle County.

However, the I-95 interchange at SR-1 has now created traffic congestions on this interstate route.

Nearly 1/3 of the interstate routes in New Castle County, amounting to 13.99 miles, operated at LOS "D" or worse in 2004.

The roadway mileage, with V/SF ratio above 0.8, increased from 19.22 miles to 30.99 miles in Sussex County. This is attributed to the growth of recreational traffic in the summer, and the overall growth of the county.

SR-1 Toll Route

SR-1 is partly a toll route for about 45 miles, but more than 20 miles of which can be traveled without paying toll. There is a public Rest Area alongside a Minor Arterial on close proximity of this toll route outside its access control line. Motorists can freely exit and enter the toll route at this location. Several ramps with sign, "Last Exit Before Toll" continue to feed traffic to Local and Collector roadways in the vicinity. It will take a few more years to achieve stability of traffic flow along this route.

There is a proposal to increase toll throughout the toll road portion of SR-1, and collect toll on the bridge across the C & D Canal, which is toll free at this time.

The HPMS sample sections on SR-1 exceed the sample adequacy requirement. We will continue to report the information from those sample sections, even though the information may not accurately represent the traffic data on the toll road portion of SR-1.

Federal-Aid Apportionment and Chicken Production in Delaware

The Delaware State Bird is the Blue Hen Chicken. Delaware ranked 8th among the states in the pounds of broilers produced in 2004 with 1,492,300,000 pounds. Delaware produced 240,700,000 broilers in 2004 and Delaware ranked 10th among the states in the number of broilers produced. In 2004, Delaware broiler production value was \$686,458,000. According to the 2002 U.S. Census of Agriculture, Sussex County, Delaware ranked first among America's counties in broiler chicken production. (Source: Delmarva Poultry Industry, Inc.)

Most of the money in the six-year \$284 billion highway and mass transit bill, passed by the House in March, is allocated to states by formulas based on miles of road, gas tax receipts, and other factors. But the bill includes more than \$12 billion for 4,128 specific projects requested by certain members of the Congress.

Listed below/next page is how some states ranked by how much they received per person for those projects:

Rank	State	Per capita	Number of projects
1	Alaska	\$1,151.48	39
17	Maryland	\$45.03	62
18	Pennsylvania	\$44.76	259
19	New Jersey	\$43.46	147
50	Delaware	\$15.31	3

(Source: taxpayers for common Cause)

In consideration of the population, land area, road mileage, NHS mileage (compare with Rhode Island), vehicle-miles of travel, contribution to Transportation Trust Fund, and the state economy, Delaware is not at the bottom of the remaining 49 states in any category; however, the Federal-Aid Apportionment to Delaware is the lowest.

It appears, there is a certain degree of inequity in the apportionment formula, which is used to determine apportionments on a state-by-state basis. Thus there is a need to review the apportionment formula, and reconcile the discrepancy.

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Personal Note by the Delaware HPMS Contact Person

Mark Eastburn, Tyrone Crittenden and Vince Rucinski, who had an active part in the HPMS submittal in the past, were not available this time. Working with new recruits, who never attended HPMS software workshop, made the task extremely difficult.

Other Factors:

- This information is a part of the HPMS submission.
- The entire data, as being submitted, was collected, compiled, and presented in the U.S. Customary Units. DelDOT has no plan to convert to metric system in the foreseeable future.

- The problem still exists in the microcomputer software dated, April 19, 2004. After updating the new 2000 Census boundaries, we had more than 35 rural samples, which became urban samples. The HPMS data requirements for rural and urban samples are different. Many times the HPMS software, under "Analysis" that includes, Calculation and Validation, cannot be performed appropriately. For a lack of complete information on just a few samples, it is not possible to analyze the entire sample sections, or the universe.

Like some of the other states, Delaware doesn't have HPMS field crew, and therefore, some data are made available just before the due date of reporting the HPMS data.

Delaware also encounters problems in "Sample Management". We feel small sections within the Volume Group Universe, which have section length below 0.10 mile, the software should ignore them. We have put efforts to collect data for lot of small sections just to avoid the errors. It is doubtful if this extra effort is worthwhile.

Small sections in the Central Business District, and around the Beach Area also generate unusually high number of intersections (> 25 per mile).

We would like to express sincere thanks to Paul Lang, (FHWA, Dover office), Thomas Roff, and Paul Svercl, (FHWA, Washington headquarters) for their patience and constant guidance to complete this onerous task.

We have not provided our own analysis to override the HPMS software capacity. The HPMS universe requirements are only for through lanes. In reality, some HPMS sections function as both thoroughfare and local access roads.

List of NAAQS Nonattainment Areas: The following is a list of NAAQS non-attainment areas contained in the State, and the urbanized areas within each NAAQS non-attainment area.

In Delaware, all three counties are declared as NAAQS Nonattainment areas.

<u>County</u>	<u>Urbanized Area</u>
1. Kent County (Nonattainment)	Dover
2. New Castle County (Nonattainment)	Philadelphia
3. Sussex County (Nonattainment)	Salisbury

List of Standard Sample Panel Groupings:

- Not applicable in Delaware

The statistical information was derived from various computer files, such as the 2004 HPMS Universe/Sample database, the Delaware Road Inventory, and the traffic data files.

TRUTH IN DATA

Although Delaware is now updating the K & D factors by using seasonal counts as well as permanent counters, we will follow the Traffic Monitoring Guide, and get the entire universe and sample data updated on a 3-year cycle. However, some of the data may not yet meet the HPMS requirements at this time.

During 2004, there were 64 ATR stations, 5 toll sites for collecting traffic data, and 648 sites using portable recorders in the highway network of Delaware. However, there were serious problems with more than 20% of the ATR stations statewide. The average permanent counter disruption was 60 days, with at least four of the ATR stations ranged from 3 to 6 months of disruption.

Therefore, several peak hour and directional split counts used in the 2004 sample data were discarded. Some of those data were adjusted from other sources, such as, traffic impact studies, while others were not adjusted at all.

We also had problems with truck related sample data (Items 81-84) and had to discard, or use from the previous year.

Some of the sensor failures are indicated below.

Site	Date Broken	Date Repaired	2004 Days Lost	Problem	Cause of Problem
8004	05/17/04	06/02/04	17	Sensor Failure	Environment
8004	06/21/04	05/11/05	194	Sensor Failure	Environment
8011	08/18/04	08/25/04	8	Sensor Failure	Construction
8011	08/27/04	09/13/04	18	Sensor Failure	Construction
8014	09/17/04	11/16/04	61	Sensor Failure	Construction
8018	08/10/04	08/20/04	11	Cable Failure	Environment
8020	06/21/04	07/10/04	20	Sensor Failure	Environment
8022	08/31/04	11/16/04	77	Sensor Failure	Environment
8032	02/23/04	07/16/04	147	Sensor Failure	Construction
8033	04/16/04	07/16/04	91	Sensor Failure	Construction
8036	08/25/04	09/10/04	17	Sensor Failure	Construction
8040	05/17/04	05/31/05	15	Sensor Failure	Environment
8075	06/21/04	08/31/04	72	Sensor Failure	Environment
8078	03/15/04	06/04/04	81	Sensor Failure	Construction
8079	01/07/04	01/21/04	15	Sensor Failure	Construction
8091	09/07/04	04/12/05	116	Sensor Failure	Construction

Chief, Highway Systems Performance Division

July 11, 2005

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The remedy, we intend for the future, is to install sensors not to be affected by reconstruction work and with longer life.

Finally, we realize that certain improvements are essential for future reports:

1. There will be full coordination with all MPOs in the compilation of HPMS data.
2. More efforts will be devoted to improve the management of HPMS Sample Sections.
3. Certain data will be subjected to field inspection.

All precautions shall be taken to prevent malfunction of traffic recorders. The quality of traffic monitoring shall be improved.

Sincerely,

S. Bhai
Senior Transportation Planner

SB:rk

Enclosure(s)

cc: Raymond J. McCormick, Division Administrator, FHWA
Ralph Reeb, Director of Planning, DelDOT
Gregory Oliver, Assistant Director, Statistics, Research & Special Programs